INS A1

METHOD FOR OPTIMIZING THE AVAILABLE TRANSMISSION CAPACITY AT SUBSCRIBER LINE NETWORKS

INS A2

The present invention is directed to a method ~~according to the preamble of patent claim 1~~.

INS A4 A3

In subscriber line networks (access networks), information are exchanged between subscriber and subscriber line network in the Prior Art according to an xDSL transmission method known to a person skilled in the art. For example, the ADSL or HDSL transmission method can be employed as a xDSL method. In such transmission methods, the maximally possible transmission capacity is highly dependent on the physical boundary conditions that prevail in the subscriber line network during the transmission event. Thus, for example, length and diameter of the subscriber line as well as the guidance in the bundle with other subscriber lines play a decisive part.

In typical subscriber line networks, further, all connections are controlled and monitored by an allocated control logic referred to as a service node (SN). For example, this service node implements a 'connection admission control' for each connection setup request coming from the subscriber or coming from the network. This means that a check is undertaken to see whether sufficient transmission capacity is available in order to connect the requested connection through to the subscriber.

The subscriber lines are terminated via modem units at both sides. The currently available modems automatically adapt to the physical boundary conditions that are present at the time. When these conditions change, for example because another xDSL subscriber is added in the same line bundle, then the modems must re-adapt since the transmission capacity may potentially be reduced, for example due to crosstalk. This leads to a reduction of the available bandwidth.

When, following the adaptation event, it is not possible to again obtain the original transmission capacity, the appertaining xDSL link is taken out of operation. This leads to undesired service interruptions.

INS. A5
INS. A6

~~The invention is based on the object of disclosing a way of how the~~ transmission of information in subscriber line networks can be more flexibly designed for xDSL subscribers.

Proceeding from the features recited in the ~~preamble of patent claim 1~~ foregoing, the invention is achieved by ~~the features recited in the characterizing part thereof.~~

It is especially advantageous in the invention that no service interruption is undertaken when a lower bandwidth is available after the adaptation event. When a higher bandwidth is available, the user can use this immediately.

Advantageous developments of the invention are ~~recited in the subclaims.~~

The invention is explained in greater detail below on the basis of a graphically illustrated exemplary embodiment.

In accord therewith, a subscriber line network AN is shown that is brought to a plurality of subscribers $TLN_1...TLN_n$. Modem units $M_1...M_n$ via which information are communicated to the respectively allocated subscribers $TLN_1...TLN_n$ are arranged in the subscriber line network AN. Only the modem units arranged in the network are shown in the Figure. The settings in the subscriber line network AN are acquired and administered by an allocated service node SN.

It is inventively proposed that a specific maintenance communication be produced between an xDSL modem unit M_x and the service ~~node~~ node SN. When the physical boundary conditions change in that, for example, crosstalk occurs in the bundle from one of the other subscribers, then the modems re-adapt since the transmission capacity may be reduced. In this case, the service node is informed of this fact via the maintenance communication. When the bandwidth is reduced, the new bandwidth can be subsequently investigated to see whether newly added connections can still be allowed.

The transmission of information is thus continued despite a lower available transmission capacity. When an increase in the bandwidth occurs, this does not remain unused (as in the Prior Art) but is immediately available for further connections. The service interruption time is thus reduced. Further, it is possible for the subscriber to continue to use the previous services, albeit to a limited extent. Finally, the network operator avoids high revenue losses.

The specific maintenance communication is realized by introduction of a maintenance communication channel K between the xDSL modem unit M_x and the service node SN. The connection control mechanisms can thus remain in the service

node. Likewise, the basic architectures of existing and future subscriber line networks can remain the same. This involves a considerable reduction in costs for the network operator. When a higher transmission capacity derives in a re-adaptation of the xDSL link, then this method also allows this capacity to be utilized. The subscriber is thus offered a better service and the revenue feasibility of the network operator is enhanced.

The coupling between the xDSL modem unit and the service node can ensue in any desired way. Thus, the maintenance communication channel K can be connected between the service node SN and the network-side or subscriber-side modem units. As a result thereof, it is possible to keep xDSL links in operation even given modified transmission capacity and to reduce the service interruption times.

For example, the communication channel can be realized as a separate time slot in TDM systems and also as a separate ATM channel or as specific ATM control cells in ATM-based networks. A realization is possible in the same way or, on the other hand, via a radio link. It is also conceivable to realize this communication channel via a TMN connection. The information exchange can thereby ensue periodically or on demand. It is also provided to allow the xDSL modem unit to communicate autonomously with the service node or only in response to requests. When a plurality of xDSL modem units are situated in the subscriber line network, then the communication channels thereof can be bundled to form a service node. Certain minimum transmission rates and/or the change granularity can also be prescribed. In the service node, of course, the information about the xDSL transmission capacity actually available can be employed for purposes other than the 'connection admission control'.

ADD A12